

# A NEW INTERTIDAL BARNACLE OF THE GENUS *ELMINIUS* (CIRRIPEDIA: THORACICA) FROM SOUTH AUSTRALIA

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## Summary

HAYNS, D. E. (1988) A new intertidal barnacle of the genus *Elminius* (Cirripedia: Thoracica) from South Australia. *Trans. R. Soc. S. Aust.* 112(2), 75-79, 31 May 1988.

A new species of intertidal barnacle from South Australia is described. *Elminius adelaidae* sp. nov. is common in the Adelaide region in sheltered localities and is very abundant in mangroves. It differs from *E. modestus*, with which it has been previously confused, by its brown colour, distinctive opercular plates, particularly the tergum which has a small and shallow articular furrow and its high intertidal habitat. The new species is compared in detail with *E. modestus*, which also occurs in South Australia, and *E. covertus* from New South Wales.

KEY WORDS: Cirripedia, *Elminius adelaidae* sp. nov., intertidal, South Australia, mangroves, taxonomy.

## Introduction

There is confusion over the identity of barnacles belonging to the Genus *Elminius* in Australia. Foster (1982) has described a species, *Elminius covertus*, from New South Wales which had previously been confused with *Elminius modestus* Darwin. Furthermore, Foster (1980, 1982) has suggested that *E. modestus* is a New Zealand species which was introduced into Australian waters in the nineteenth century from fouling on shipping.

South Australian barnacles have been neglected in the early taxonomic literature and *E. modestus* in Australia was only recorded from N.S.W., Victoria and Tasmania (Darwin 1854; Hoek 1883; Nilsson-Cantell 1926; Moore 1944; Pope 1945). The earliest report of *E. modestus* in S. Aust. is comparatively recent (Womersley & Edmonds 1958). Nevertheless, the gulf areas of S. Aust. provide a suitable habitat in which members of this genus are highly abundant.

In South Australia, *E. modestus* has been recorded on the pneumatophores of *Avicennia marina* in the Spencer Gulf and Gulf St Vincent (Womersley & Edmonds 1958; Hutchings & Recher 1982; Bayliss 1982), on rocks and wooden structures on Kangaroo Island (Thomas & Edmonds 1979) and at Adelaide (Foster 1982; Keough 1983). Foster (1982) also records *E. covertus* at Port Adelaide.

In this paper a new species of *Elminius* which is abundant in the Adelaide region is described. This species has escaped previous description through confusion with *E. modestus* and a neglect of thorough taxonomic work on South Australian barnacles.

## SYSTEMATICS

Suborder Balanomorpha Pilsbry, 1916  
Superfamily Balanoidea Leach, 1817  
Family Archaeobalanidae Newman & Ross, 1976  
Subfamily Elminiinae Foster, 1982  
Genus *Elminius* Leach, 1825  
Type species *Elminius kingii* Gray, 1831

*Elminius adelaidae* sp. nov.  
FIGS 1-2

Synonymy: *Elminius modestus* Bayliss, 1982:212  
*Elminius covertus* Foster, 1982:26

*Holotype*: SAM C4101, collected on leaves of *Avicennia marina* on Garden Island, Port Adelaide, S. Aust., by D. Bayliss, 22.ix.1986.

*Paratypes*: SAM C4102, NMV J14009, WAM 83-87, collected by D. Bayliss, 22.ix.1986, from same locality. Holotype and paratypes preserved in 75% alcohol, holotype dissected (partially).

*Description of holotype*: Shell (Fig. 1A and B): conical, light brown, almost translucent. Parietes slightly undulating with broad longitudinal folds. Orifice pentagonal in outline. Basis membranous, basal outline sinuous. Alae wider than radii with less oblique summits. Radii with oblique summits, narrow, not completely covering underlying alae. Holotype 9 mm in basal diameter, 8 mm in width, 4 mm in height.

Opercula (Fig. 2A, B): Scutum longer than high. Basal margin convex with upward curving at tergal corner of basal margin. Articular ridge, articular furrow moderately developed. Adductor ridge, adductor pit not apparent. Externally, growth ridges present.

Tergum with vertical articular ridge not folding inwards to form furrow except at apical end where small, very shallow furrow apparent. Articular

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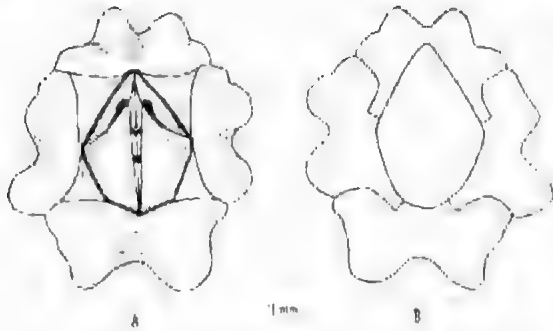


Fig. 1. *Elminius adelaidae* sp. nov. holotype. A: External view of shell; B: inner view of shell.

margin concave. Crests for depressor muscles at carinal end. No spur.

Mouthparts (Fig. 2C, E, F): Labrum with 3 teeth, with setulae on each side of central notch. Mandible with 5 teeth, short pectinate edge terminating in short curved spine. Maxillule with 2 large spines above notch, 5 smaller spines in notch, 4 large spines below notch. Five smaller spines about half length of large spines at lower angle.

Cirri (Fig. 2G-I): Cirrus I with anterior ramus twice as long as posterior ramus, distal segments of anterior ramus with long setae. Segments of posterior ramus slightly protuberant. Anterior ramus of cirrus II slightly longer than posterior ramus, segments slightly protuberant anteriorly. Cirrus III with anterior ramus slightly longer than posterior ramus. Setae on both rami extremely long; stout pectinate setae on the posterior ramus (Fig. 2I). Segments slightly protuberant anteriorly. Cirri IV to VI all subequal in length, segments have 4 large pairs and 1 small pair of setae on anterior face and small proximal pair of setae between segments (Fig. 2D). Penis as long as cirrus VI, with setae, no basidorsal point. Number of segments in the rami of cirri I-VI shown in Table 1.

*Variation:* Shell sometimes tubular; parieties can be smooth or, if undulating, can have variable number of gentle longitudinal folds. Maximum basal diameter 13 mm. Brown coloration can be slight. Specimens collected high in the intertidal zone are nearly translucent.

*Etymology:* The specific name is derived from the type locality, Adelaide.

*Comparison with other species:* *E. adelaidae* can be distinguished from *E. modestus* and *E. covertus* by differences in the opercular valves. The tergum of *E. adelaidae* has a concave articular margin and the articular furrow is restricted to the apical end. The vertical articular ridge runs the length of the tergum and there is only a very slight narrowing at the centre. In both *E. modestus* and *E. covertus* the articular ridge folds inwards forming a deep articular furrow and a marked narrowing at the centre. The articular furrow continues from the apical end to almost the basi-scutal angle and the articular margin forms a straight line except in worn specimens.

The scutum of *E. adelaidae* has an upward curving of the tergal corner of the basal margin. This feature may be observed externally in larger specimens, but is difficult to detect in smaller specimens in the field. The tergal corner of the basal margin of *E. modestus* and *E. covertus* is essentially flat.

The shell of *E. adelaidae* is similar to *E. modestus* except for a slight brown coloration. It never has the buff red colour with narrow contrasting ribs observed in *E. covertus*. Colour is not a good guide to distinguishing between *Elminius* species as they are subject to decoloration from wear and also from algal growth. The shell of *E. adelaidae* can appear almost black due to algal growth and golden brown in other specimens due to the developing gonads showing through the near translucent shell. In some specimens the brown coloration is very slight.

The shell of *E. modestus* is white, but this barnacle also suffers from decoloration due to algal growth and wear. The ribs on *E. covertus* can be worn away in older specimens. Care is required in distinguishing between *E. adelaidae* and *E. covertus* in such cases, because *E. adelaidae* sometimes has slight folds around the base which could be confused with the remnants of ribbing on *E. covertus*.

Stout pectinate setae are found on the posterior ramus of cirrus III of both *E. adelaidae* and *E. covertus*; but not *E. modestus*. The setae on both

TABLE 1. Number of segments in rami of holotype and four other specimens of *Elminius adelaidae* sp. nov., anterior ramus first.

Shell length (mm)	Cirrus					
	I	II	III	IV	V	VI
9.0 (holotype)	14, 7	9, 9	12, 11	22, 24	27, 28	30, 29
9.0	15, 7	9, 8	12, 11	20, 19	22, 22	24, 23
8.0	14, 8	9, 9	13, 11	25, 25	28, 24	29, 28
10.0	12, 6	8, 8	11, 10	24, 18	20, 19	22, 21
10.0	13, 7	10, 10	13, 12	26, 25	29, 25	30, 29

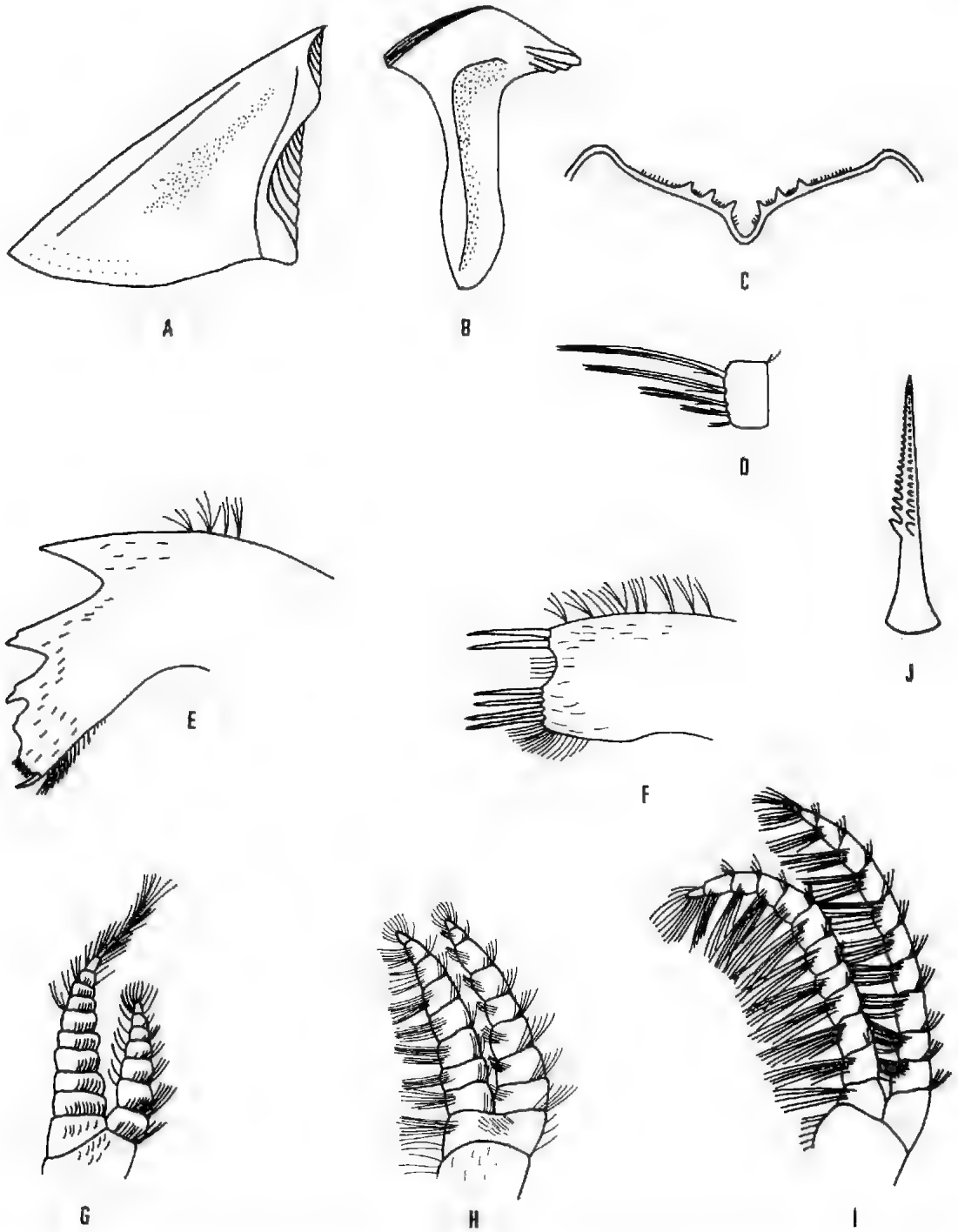


Fig. 2. *Elminius adelaidae* sp. nov. holotype. A: scutum; B: tergum; C: labrum; D: middle segment, posterior ramus, cirrus VI; E: mandible; F: maxillule; G-I: cirri I-III. J: pectinate seta from posterior ramus of cirrus III.

rami of cirrus III in *E. adelaidae* are extremely long compared to those found on cirrus III of *E. modestus* and *E. covertus*. The maxillule has two large spines above a notch with four large spines beneath the notch. *E. modestus* and *E. covertus*, however, have three large spines beneath the notch.

The labrum of *E. adelaidae* is similar to *E. modestus* and *E. covertus* in that there are three teeth on either side of the central notch. It differs in a distinct curve at the ends giving a "handle-bar" like appearance.

In gaping animals the tergo-ventral flaps are white to cream with two dark brown spots (Fig. 1A). *E. covertus* has six pairs of dark spots on white tergo-ventral flaps and *E. modestus* has one black spot on white tergo-ventral flaps (Foster 1982, Fig. 1A, B).

**Habitat:** *E. adelaidae* is found in the high intertidal zone in sheltered waters where there is little wave action. It is highly abundant on pneumatophores, leaves and branches of *Avicennia marina* which are submerged at high tide. It is also found on rocks and artificial structures. *E. modestus* is usually found at mean tide level and below. It sometimes settles in the mangroves and there may be a small amount of overlap between the two species.

**Distribution:** The distribution of the three species in Australia has not been determined. In the Adelaide region, *E. covertus* does not occur and *E. adelaidae* is the main high shore species of *Elminius*.

### Discussion

The description of *Elminius adelaidae* sp. nov. brings to four the number of extant species of

*Elminius*. Of these *E. kingii* Gray, 1831 is restricted to South America and the remaining three are found in Australia. *E. modestus* is also found in New Zealand and was introduced from fouling on shipping into European waters (Flowerdew 1984). Only one extinct species, *E. chapronierei* from the lower Miocene, is recognised (Buckeridge 1983). On the basis of the setation of cirrus III, *E. adelaidae* is close to *E. covertus*, but the shell characteristics of *E. adelaidae* are more like those of *E. modestus*.

Foster's (1980, 1982) hypothesis that *E. modestus* is a New Zealand species has received some support from electrophoretic studies by Flowerdew (1984) which indicate a lack of genetic differentiation between specimens from New Zealand and Tasmania. *E. modestus* does not appear to be permanently established in Sydney (Foster 1982; Egan & Anderson 1985). In S. Aust. *E. modestus* corresponding to the description of Darwin (1854), Moore (1944 Fig. 1D) and Foster (1978 Fig. 57) is found and appears to be permanent and common. Until more information is obtained about *Elminius* in Australia, particularly the distribution and clarification of species, it should not be concluded definitely that *E. modestus* was introduced.

### Acknowledgments

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**A NEW SPECIES OF TERTIARY CHITON  
(MOLLUSCA: POLYPLACOPHORA: ACANTHOCHITONIDAE)  
FROM SOUTH AUSTRALIA**

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**Summary**

A new species of Tertiary chiton, *Notoplax (N.) arenaria* sp. nov., is described from the Dry Creek Sands (Pliocene, Yatalan) from South Australia. The new species most closely resembles the extant *N. (N.) mayi*, but is distinguished from it by a more regularly grooved jugum and by the strong lateropleural rib on the median valves.

KEY WORDS: Chiton, Polyplacophora, Acanthochitonidae, South Australia, *Notoplax*, Tertiary, Pliocene, new species.